

# NG9-1-1 in Michigan

presented by

Becky Holloway, Product Management, Frontier Communications

Phil Bates, E911 Service Manager, Frontier Communications

Mark Grady, founder, INdigital Telecom



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

# Agenda and Discussion topics

- Welcome and Introductions
- FCC Update – wireless dockets (FNPRM and NOI)
- The evolution of NG9-1-1
- What does the technology of NG9-1-1 represent?
- How do we get there from here?
- Frontier's plan to NG9-1-1
- Non-voice communications
- Summary / overview
- Q&A



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

© Frontier Communications. This document is intended only for the SOM 9-1-1 Committees and Sub-committees.

# Introductions

- Frontier Sales
  - Garth Stidolph
  - Rob Shippy
- Frontier Service Management
  - Phil Bates
- Frontier Product Management
  - Becky Holloway
- Indigital
  - Mark Grady
  - Eric Hartman



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

# FCC September 23, 2010 Press Release

- FCC Takes Action to Improve Wireless 9-1-1 Services
  - Action to help strengthen and improve the ability of Public Safety Answering Points (PSAPs, or 9-1-1 call centers) to quickly locate wireless 9-1-1 callers and dispatch emergency responders to assist them during emergencies.
  - FCC's new rules are essential to ensuring that wireless carriers are taking the necessary steps to provide more accurate 9-1-1 caller locations.
  - The Order requires wireless carriers to provide reliability data on each 9-1-1 call



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

© Frontier Communications. This document is intended only for the SOM 9-1-1 Committees and Sub-committees.

# Further Notice of Proposed Rulemaking (FNPRM)

- Explores how to further improve the location capability of 9-1-1 and E9-1-1 services for existing and new voice communications technologies, including new broadband technologies associated with the deployment of Next Generation 9-1-1 (NG9-1-1) networks.
- The FNPRM seeks public comment on a number of issues
  - Should the FCC should adopt a technologically neutral location accuracy standard ?
  - How to verify compliance?
  - How wireless 9-1-1 caller location accuracy can be improved?

# Notice of Inquiry (NOI)

- Explores whether to extend E9-1-1 requirements to new and emerging voice communications services, devices, and application enabled by broadband technologies
- Seeks public comment on whether to:
  - Require certain Voice over Internet Protocol (VoIP) service providers to automatically identify the caller's location, rather than requiring the caller to self-report his or her location.
  - Whether other forms of VoIP services should be subject to the 9-1-1 rules.
  - Focuses on the potential impact of future NG 9-1-1 deployment on location accuracy and automatic location identification.



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

© Frontier Communications. This document is intended only for the SOM 9-1-1 Committees and Sub-committees.

# FCC updating 911 for the texting generation

- *“In a bid to bring the life-saving emergency service 911 into the 21st century, the FCC is looking at letting citizens report crimes through text messages and even stream video from their mobile phones to emergency centers.”*

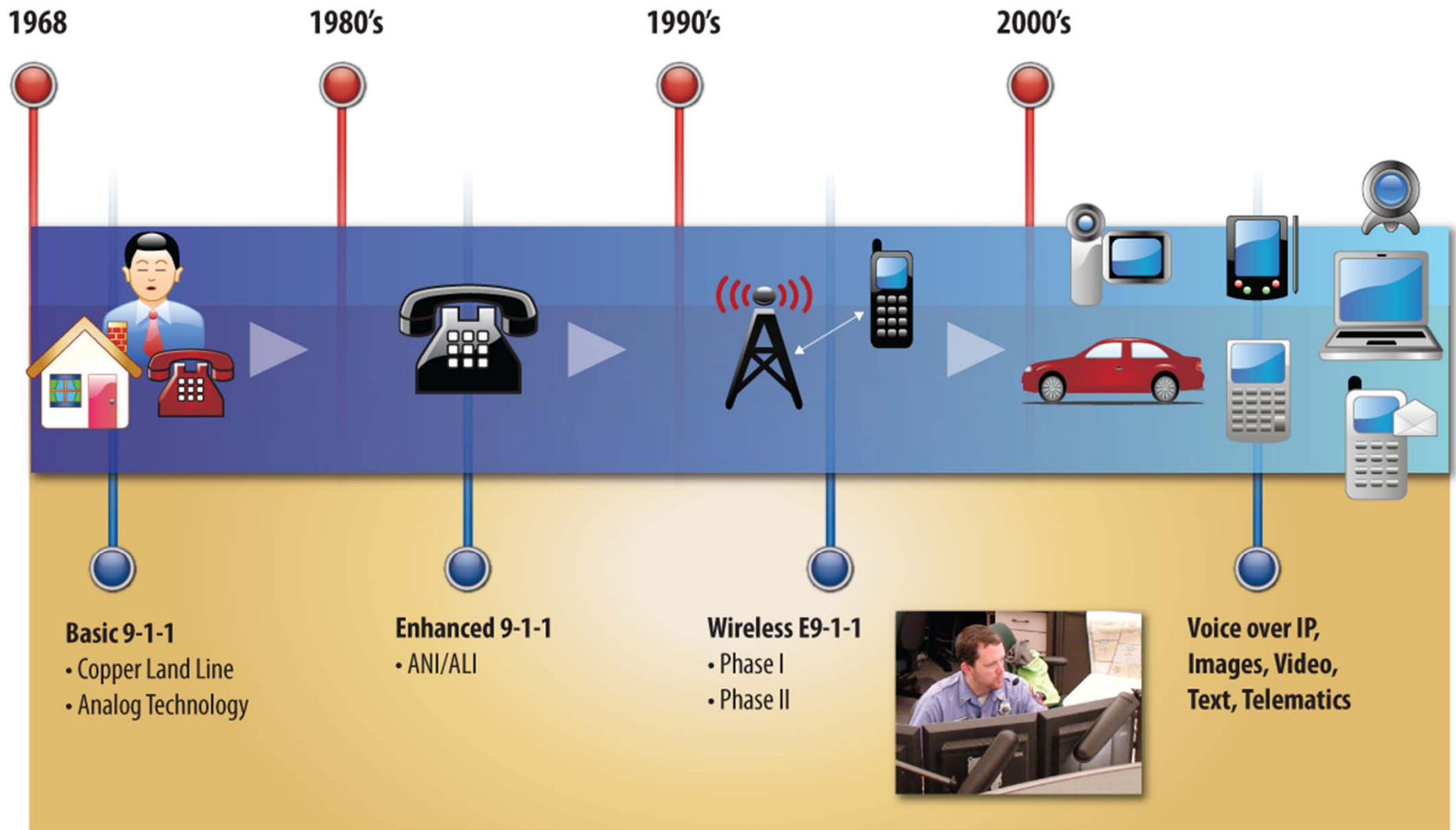


from the FCC September 23, 2010 press release



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

© Frontier Communications. This document is intended only for the SOM 9-1-1 Committees and Sub-committees.



**Today's 9-1-1 system is outpaced by current technology**

pictogram courtesy 911.gov – the US Department of Transportation



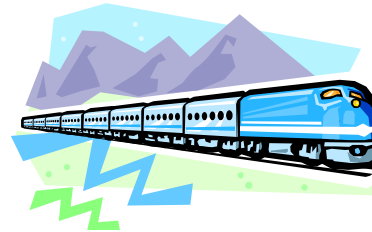
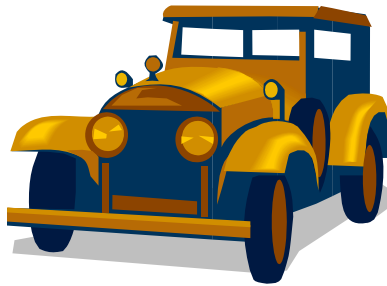
**Our Mission** | To be the leader in providing communications services to residential and business customers in our markets

© Frontier Communications. This document is intended only for the SOM 9-1-1 Committees and Sub-committees.

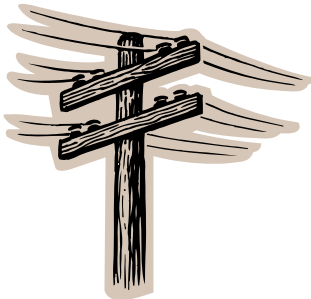


# Parallel paths?

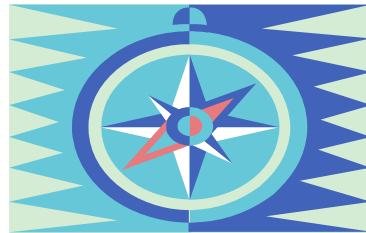
## Evolution of Transportation



## Evolution of 9-1-1



CAMA trunks



E9-1-1 (Location)



Wireless



Next Gen  
(NG9-1-1)

**based on concepts created and presented by L.R. Kimball**



Our Mission | To be the leader in providing communications services  
to residential and business customers in our markets

© Frontier Communications. This document is intended only for the SOM 9-1-1 Committees and Sub-committees.

# 911 technology and the path of transportation

- As improvements and enhancements were made to transportation, the following benefits were realized:
  - Faster
  - More flexible
  - More efficient
  - More reliable
  - Increased security
  - Scalable to serve more people
  - Survivability
  - Measurable benefits to society
- Technology realized the same benefits.

# Let's talk about the obvious...

- Progress costs more – in transportation and in 9-1-1
  - Direct trunking to Basic 9-1-1
  - Basic 9-1-1 to Enhanced 9-1-1
  - Enhanced to include wireless (phase 1)
  - Wireless phase II
  - E9-1-1 to NG 9-1-1
- Have the funding mechanisms kept pace with technology ?
- Has public policy kept pace with technology?

# Chapter 2

What does the technology  
of NG9-1-1 represent?



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

© Frontier Communications. This document is intended only for the SOM 9-1-1 Committees and Sub-committees.

# Today's 9-1-1 versus NG9-1-1

Today's 9-1-1	Next Generation 9-1-1
Virtually all calls are voice callers via telephones using analog lines to access PSAP.	Voice, text, or video information, from many types of communication devices, sent over IP networks
Most information transferred via voice	Advanced data sharing is automatically performed (supplemental information)
Callers routed through legacy selective routers, limited forwarding, transfer and backup ability	Physical location of PSAP becomes immaterial, callers routed automatically based on geographic location, enhanced backup and resiliency
Limited ability to handle overflow situations, callers could receive a busy signal	PSAPs able to control call congestion treatment, including dynamically rerouting callers



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

# The Need for NG9-1-1

- Constant adaptation of old 9-1-1 infrastructure is expensive and slow
- New communications technologies need access to 911
- Growing data rich environment – 9-1-1 can't handle it
- Need data bandwidth, modernized network (IP), open and common standards
- Need nationwide intercommunication (and beyond)



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

# Consensus Within the 9-1-1 Community

- Implement advances in technology that provides
  - Quicker and more accurate information
  - Better and more useful forms of information (real-time text, images, video, and other data)
  - More flexible, secure and robust Public Safety Answering Point (PSAP) operations

# Challenges

- Funding
- Updated Legislative / Regulatory Language
- Coordination of these issues:
  - Advance agreements
  - Management of access, data
  - Needs of First Responders –  
Who wants what and how?
  - Cost sharing
  - Common Protocols
- Inter-local agreements and policy based routing
- Operating policies for 9-1-1 calls transferred between local authorities



# Chapter 3

How do we get  
there from here?



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

© Frontier Communications. This document is intended only for the SOM 9-1-1 Committees and Sub-committees.

# Is there a clear path to NG9-1-1 ?

- No. Not today...
- There are competing standards and factions within the standards setting bodies
- ATIS versus NENA versus IETF versus ESIF versus CSRIC versus...
- Some elements are getting clearer

# NENA Baseline NG9-1-1 definition

1. The minimum required components or capabilities encompass architectural, security, data, confidentiality, interconnection with other 9-1-1 systems, and operations aspects of NG9-1-1 service as defined in NENA Standards and related documentation. This definition sets out the minimum requirements, and it not intended to limit other types of services and features set out in the NENA i3 Standard. ESInet (Emergency Service IP network)
2. GIS data creation and associated management tools
3. Publication of Authoritative NG9-1-1 Validation Related Databases

# NENA Baseline NG9-1-1 definition

(continued)

4. Publication of Authoritative NG9-1-1 Routing Databases
5. Support for legacy originating services via gateways (e.g., access to traditional ALI databases)
6. Geospatial controlled IP software call routing function (ECRF and ESRP)\*
7. The ability to control call routing based upon a policy routing function (PRF) with standardized methods to define/build and control Policy Rules
8. Additional data acquisition after call delivery to facilitate call processing by the calltaker or other public safety entities

\* Emergency Call Routing Function (ECRF) and Emergency Service Routing Proxy (ESRP)



Our Mission

To be the leader in providing communications services to residential and business customers in our markets

# NENA Baseline NG9-1-1 definition

(continued)

9. Support for transfer of calls with accumulated call taker notes and added data, or an access to such data via a key or link by any authorized entity interconnected by an ESInet.
10. Support for system monitoring/logging/discrepancy reporting necessary to support troubleshooting and ongoing operation and maintenance.
11. Emergency Call Routing Function (ECRF) and Emergency Service Routing Proxy (ESRP)
12. One more and we would have a twelve step program



Our Mission

To be the leader in providing communications services to residential and business customers in our markets

# Chapter 4

## What is the Frontier technology plan?



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

© Frontier Communications. This document is intended only for the SOM 9-1-1 Committees and Sub-committees.

# The New Frontier

- Follow NENA NG9-1-1 baseline definitions
- Provide IP delivery of 911 calls
- Provide IP network for the creation of ESI-nets
- Provide routing and data capabilities so that we can deliver 3<sup>rd</sup> party call data to the PSAP
- Operate a system that can scale to promote interoperability and resource sharing
- Create a database system that transitions to i3 standards
- Provide equipment and software that provide cutting edge technologies



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

© Frontier Communications. This document is intended only for the SOM 9-1-1 Committees and Sub-committees.

# Existing Frontier 9-1-1 Network

- In Michigan, today, the Frontier's network has:
  - Switch based selective routers (legacy)
  - ECS-1000 ANI/ALI controllers
  - The primary service areas in the state are within the LATAs
  - ALI service is provided by centralized databases with regional access nodes – or localized databases



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

© Frontier Communications. This document is intended only for the SOM 9-1-1 Committees and Sub-committees.



# Transitioning the New Frontier

- The new Frontier network is built on top of the existing network allowing:
  - Customers to move to the NexGen Network based on their timetable, not ours.
  - The ability to provision service in a regional, state or multi-state configuration
  - Choice of CPE, not vendor specific
    - Hosted or On-Site
  - Peace of mind -- tried, true proven solutions



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

# Some First Steps

- Move to IP when and where possible
- Promote increased sharing of data, resources, procedures and standards (cost sharing)
- Facilitate increased coordination and partnerships
- Offer customized pricing and configurations to meet local needs

# Products and Services

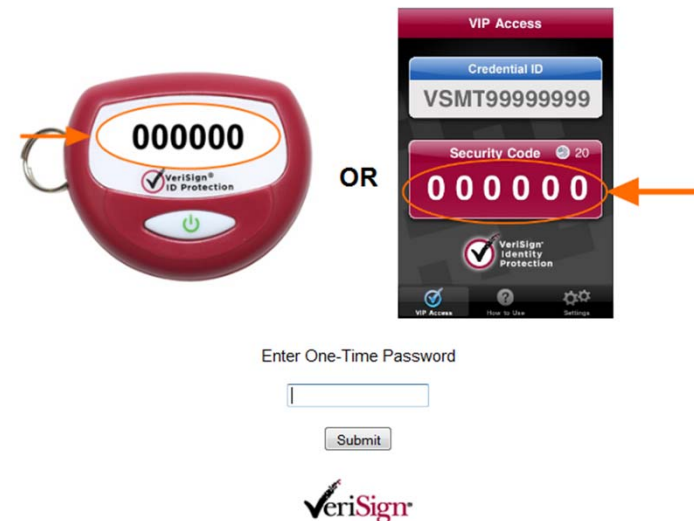
- Hosted and OnSite CPE options at the PSAP
- Modern tools for administrative personnel
  - ALI database solutions – “INDB”
  - Network PSAP toolkit – “NPTK”
- Large scale network modernizing
  - IN911 network operator
  - ESI NET developer, systems integrator
- Deploy emerging accessibility technologies that enable non-voice ‘calls’ to meet individual needs

# INdb – the NG database core

- INdb is a modular, NG compliant database platform
- The modular design allows dynamic database services/queries from multiple stakeholders
  - full support of legacy, E2+, and NG service databases via a common access platform
  - SQL open architecture allows unlimited record storage and distributed service clusters
  - customizable template based input/output formats allow seamless integration of legacy and NG based equipment

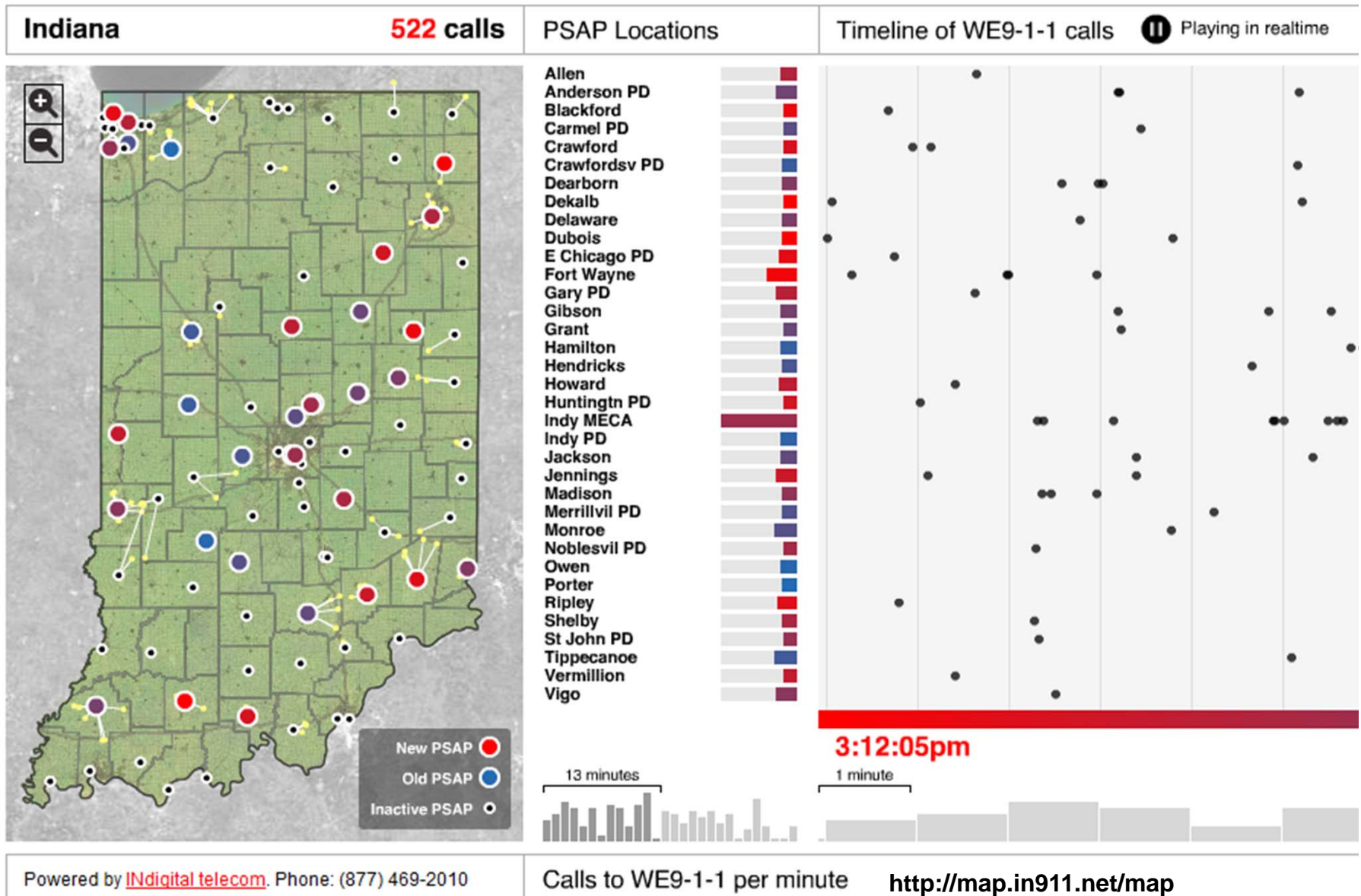
# Security Protocols

- Our goal: ‘Kimball level’ security of IP networks
  - INdigital prefers fully private network architectures between trusted hosts
  - Public facing servers are firewall protected and data is processed into the private network using file encryption and firewalls
  - Secure FTP file transfer
  - Extensive use of one-time use password tokens
  - Safe, firewall rule based data exchange protocols



# NPTK – Network PSAP ToolKit

- NPTK is a web based database/MSAG system; allows users to view, update and submit database inquiry requests
  - An administrative level database reporting system
  - A high security, managed access platform
  - The open architecture allows for dynamic database queries – consistent with NENA’s NG future path
  - PSALI type interface for enterprise class customers
    - ready for, and developing interconnection with RedSky, Wireless Werx, and other in the enterprise space
    - ready for, and developing interconnection with service providers: Comcast, OnStar, Intrado



Our Mission

To be the leader in providing communications services to residential and business customers in our markets

# Next Generation CPE

- Our offering is CPE vendor agnostic, with a focus on providing flexible options
  - The customer can use any NG hardware
  - Fully compatible with other vendors CPE/software as used or needed by the customer
  - Supports hosted and on-site CPE solutions
    - PlantCML
    - Intrado/Positron
    - Solacom Guardian solution





# SIP:ME

(session initiation protocol: message engine)

- A modular service platform for:
  - SS7 legacy voice messaging (from Cronus)
  - legacy ALI service interface (tabular routing)
  - GIS based / geospatial selective routing
  - PIDFlo (SIP header) based routing
  - policy based routing
  - dynamic call control
  - SMS text messaging (via texTTY)
  - real time text (RTT) supporting T.IM and T.OP
  - system logging and diagnostics (test board)



Our Mission | To be the leader in providing communications services to residential and business customers in our markets 33

**one diagram in this slide  
was removed because it  
contained confidential  
information**



Our Mission | To be the leader in providing communications services to residential and business customers in our markets 34

# policy based routing



Call Flow User Admin

## Call Center

Call Center Selection:

Call Center Options	1st Response	2nd Response	3rd Response
<b>Call Response Menu</b>   <b>Ring Timeout</b> <input type="text" value="30"/> (Slide to select ring timeout) Timeout in seconds: 30  <b>Overflows</b> Choose Overflow: <input type="text" value="sip:9999@66.170.51.4"/>  <input type="button" value="Apply Strategy"/>	Test Router 1 on registrar-1  990010010@registrar-1		
	Test Router 2 on registrar-2  990010010@registrar-2		
		Solacom  1120730001@10.8.8.108 DISABLED	
	Test Router 2 on registrar-1  990010011@registrar-1		
			Test Router 2 on registrar-2  990010011@registrar-2



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

# Chapter 5

## Enabling Non-Voice Communications



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

© Frontier Communications. This document is intended only for the SOM 9-1-1 Committees and Sub-committees.

# SMS to TTY service

- Allows title IV leverage of the federal ADA
- No new training for PSAP call takers that are TTY fluent, zero barrier to entry at the PSAP
- Targeted to serve the HHSI community
- Pre-enrollment by SMS short code, 800 call or the web
- All calls routed and delivered identically to a 911 call for a non-HHSI person
- Core integration to INdb and SIP:ME

## TextTY benefits (continued)

- Zero changes to the wireless carrier networks
- Can work on any phone that can do SMS (text)
- Preserves HCO/VCO, fully ADA compliant
- Can include, but does not require PII (personally identifiable information)
- HHSI review by NENA accessibility committee
- Optimized for quick system wide rollout

# TexTTY platform (Summary)

- The roadmap will include several additional feature sets:
  - **the base platform** will use TTY at the PSAP
  - **series 2** platform will support an XMPP console interface at the PSAP
  - **series 4** platform will add a smart phone application that passes location within the SMS message stream
  - **series 6** platform will allow XMPP pix, video transfer via the phone IP link to a clickable URI link

# Real Time Text (RTT) to 9-1-1

a look at the text.instant messaging platform

- TextTTY is a CRTC (Canadian) service concept that allows pre-enrollment of ‘dumb’ phones to ensure accessibility – via ALI database marking
- T.IM provides RTT and GPS + network based location for MID (mobile internet devices)
- SMS-911 is a fallback for T.IM (if the IP link fails)

Key points:

- INdigital has all of these services in a ‘market ready’ state
- Roll out will be Q-2 ’11 at Purdue and IU



Our Mission

To be the leader in providing communications services to residential and business customers in our markets

40



# Chapter 6

## Summary Overview



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

# Frontier service offerings

- ESInet provider – Maximize networking
  - Proven history of delivering 911 calls using emerging NG technologies with a NENA i3 focused solution
  - Designed to seamlessly share data between agencies
- Database management services
  - New easy to use network reporting
  - Dynamic access to data
- Immediate access to emerging hosted & onsite NG911 CPE platforms
- Available as a regional, state or multi-state solution.



Our Mission

To be the leader in providing communications services to residential and business customers in our markets

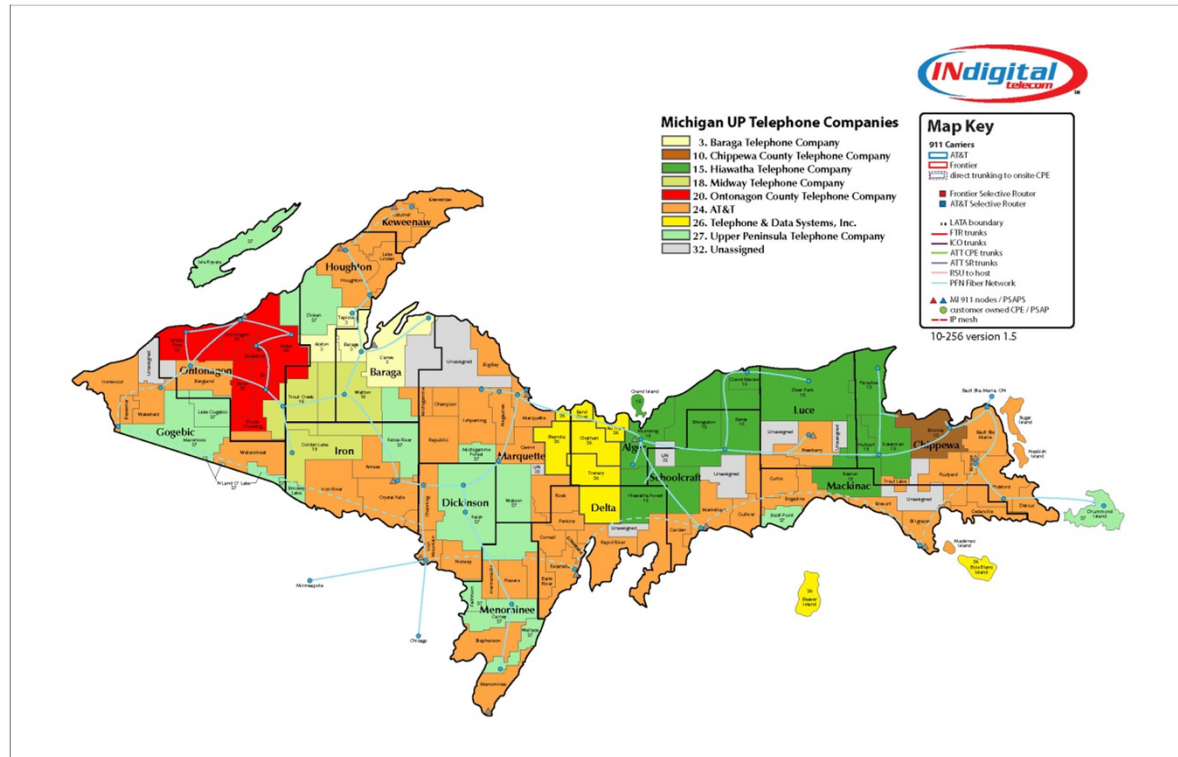
42

**one diagram in this slide  
was removed because it  
contained confidential  
information**



Our Mission | To be the leader in providing communications services to residential and business customers in our markets 43

one map in this slide was removed because it contained confidential information



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

# Benefits

- End user CPE options
  - Customer has complete flexibility in equipment and PSAP arrangement
- Extensive support for multiple protocols that ensure the secure exchange of network data
- Enhanced ESI-net services that encourage data sharing, inter-local cooperation, and cost sharing
- Policy based call routing

# Q & A



Our Mission | To be the leader in providing communications services to residential and business customers in our markets

© Frontier Communications. This document is intended only for the SOM 9-1-1 Committees and Sub-committees.